Evaluation of oleic acid as additive in automatic transmission fluid

Abstract

Transmission fluid has already being monopolized by petroleum oil over these years, either mineral oil or synthetic oil, the base oil originated from the crude oil. Currently, with environmental issue becomes globally concerned, it is time to move toward green technology and more to the sustainability, resource renewability and biodegradability. To respond to this challenge, a research focusing on development of environmental friendly lubricant for Automatic Transmission (AT) is conducted. In this paper, the Refined, Bleached, and Deodorized Palm-Olein (RBDPO) mixed with the Automatic Transmission Fluid (ATF), is developed and tested. The research focuses on some parameters such as anti wear and friction coefficient characteristics. The test is conducted using four ball wear tester machine to analyze anti wear of the lubricant as well as to simulate the sliding surface of gear operation inside the transmission which is the most critical operation condition for the lubricant. The method of testing is based on ASTM D4172 Test B condition for wear measurement. By comparing the experimental results between mixed lubricants and the commercial ATF, it can be seen that the palm olein is very potential to become a base oil for transmission lubricant in the future due to its promising performance of the tested physical properties.